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ANALYZING BUSINESS FEASIBILITY AT GAS STATION FOR PT. TOTAL OIL INDONESIA

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Abstract— The government replan conversing BBM to BBG program as one of other solutions to decrease subsidy gradually. PT. Total Oil Indonesia as one of oil and gas companies in Indonesia sees the problem as an opportunity to build SPBG to support the government's program. To analyze business feasibility, business situation analysis was done by using Feasibility Study and Sensitivity Analysis. The primary indicator used to determine the feasibility was NPV (Net Present Value), IRR (Internal Rate of Return) and PBP (Payback Period). The result of analysis of information gathered showed that SPBG development project would be optimal and feasible to be started if BBM subsidy was removed, so that the gas price would be 40% cheaper than premium price, the availability of equal gas-buying price as raw material, and also the implementation of government's plan to give free converter kit to the society. To get it well implemented TOI will take a part in cooperating with the government program to develop step in constructing gas station with 4 scenarios already explored before that is firstly applied to the public transportation and then to all of Indonesian people. The steps are installing the Hybrid Station to see how the market works and then going to the next step is to construct pipeline station system and further more (for stable condition) the last step is to build a Mother – Daughter Station package. The implementation done in a working program will be held for short-term (5 years) as pilot project evaluation and long-term (15 years).

Keywords: BBM Subsidy, Conversion from BBM into BBG, Feasibility Analysis, Gas Refueling Station (SPBG)

I. INTRODUCTION

In Indonesia, gas is not something new. There has been a program to use gas as fuel dating back to 1986. However, because at that time the price of oil was still affordable and gas stations were located everywhere, there was no interest to use gas instead of oil . In 2011, the government once again reinforced the program to use gas instead of oil in vehicles. But until this day, it seems the program is not very successful. Some problems that hinder the conversion of BBM to BBG include the lack of supply of gas, people are still skeptical to use BBG, and the number of gas stations that provide gas fuel is still very limited. Observing the condition at Total Oil which already exists in Indonesia for quite a long time through PT. TOI, especially the *Retail Development* division which is responsible towards the gas station project, is interested in the business opportunity as described above

TO international is the biggest French company, and also one of the four biggest and most well known oil and gas companies in the world. TO international has operated in more than 130 countries with more than 100.000 employees. In Indonesia, TO International has been conducting upstream activities since 1968, in conformity with the signing of the agreement to work together in the exploration and production in Sumatra, followed by Mahakam (1972), Handil (1974), and so on. TO International Indonesia has been officially founded since January 31st 2003 with the name of PT. TFE Indonesia. The first commercial activity took place in June 2003 and has produced 3,210 MT (*Metric Ton*) by year end. The year of 2004 was the first year where PT. TOI actually operated fully and became well known as the producer of lubricating products. For the first time, PT. TOI operated gas stations or SPBU in 2008.

Business activities of TO International are divided into three types:

- Upstream (hulu), includes explorations, development and production of natural oil and gas, as well as liquid gas. This also includes energy operations of the sun and wind.
- Downstream (hilir), includes oil processing (refinery) and marketing, altogether with the selling and transmission of oil and BBM products.

- Chemicals, which is made up of a few activities such as the production of basis chemicals (Petrochemicals, Fertilizer) and specific chemicals, for the industry and public consumption.

SPBU PT. TOI is a project from the *Retail Development* division, consisting of 7 members and moderated by the VP *Retail Development*. The first step in building SPBU is to survey the location. This is done by the *Development Manager*. The result of the survey is then analyzed and reported to the *Sr. Development Manager*, who will review it over and hand it to the VP. Development (cost estimation, utilities/components, design) is done by the *Engineering Manager* and *Construction Manager*. The operation will be monitored by the *Operations/Sales Manager*. The last three people will report directly to the VP .

To preserve a healthy APBN and increase the budget for development, the subsidization needs to be decreased slowly, in stages, and assuries that the subsidization is actually being used by those in need. The government has selected these steps for 2012:

- Limiting the subsidization of oil fuel with forbidding the consumption of premium BBM for personal four-wheeled vehicles in Java – Bali since April 1st 2012.
- Increasing the price of premium.
- Conversing oil fuel to gas fuel. This condition raised the use of alternative energy such as *Fuel Nabati* (BBN) and *Gas Fuel* (BBG).
- Continuing the program of conversing kerosene to 3 (three) kilogram tube LPG.
- Perfecting the policy regulating subsidization of BBM and 3 (three) kilogram tube LPG

Because of that, one of the steps the government took is to once again begin pushing the conversion of oil fuel to gas fuel for four-wheeled vehicles. This step is taken as a way to suppress the consumption of subsidized oil fuel so that it will not grow larger than its quota in the APBN 2012.
Main issues of this part are: Conversion BBM to BBG, Gas Supply, Kit Converter, Consumen, and gas-refueling station (SPBG).

II. BUSINESS ISSUE EXPLORATION

The need of natural gas for vehicles will increase in the Asia-Pacific region, this will happen with great support of both the availability of energy and economic condition. Nevertheless, the success of using natural gas as fuel program depends on several factors or challenges faced by each countries. The increase of crude oil price on every year affects the importance of alternative fuel, in this case, natural gas (compressed natural gas) is one of many right solutions, especially in country with high natural gas availability such as Indonesia.

A. Conceptual Framework

This framework is a resume to limit patterns of thought about important matters or keys of business properness analysis implemented to build and operate a gas-refueling station, with government policy as the challenge.

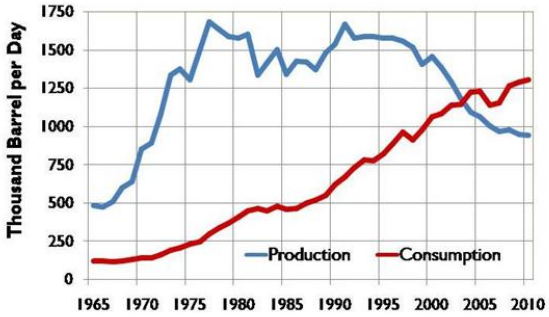
The following things are the matters that play the important roles in business properness analysis to build a gas-refueling station.: Regulation & Policy, Market, Supply, Technology, and Financial&Investment

B. Method of Data Collection and Analysis

Method of Data collection that is used in this study is searching on many sources like internet, article, government's regulation and policy and interview with people involved in gas industry. For the method of analysis is using feasibility finance study and sensitivit analysis of price an d currency.

C. Analysis of Business Situation

In Indonesia, which still holds subsidy system, this condition burdens the government's budget. Nowadays, The average price of crude oil exceeds the assumption of APBN in 2012. The increase of oil price and subsidy for the last 5 years has forced the government to find out solution to secure the budget, one of the solutions is by converting oil fuel to gas fuel. This solution is expected to be able to decrease oil subsidy.



Indonesia Oil Production and Consumption
(Source: BP Statistical Review of World Energy 2011)

1. Regulation and Policy

Converting the using of oil fuel into gas fuel should be done to increase the resilience of national energy, for both short term and long term period. Oil resources become less and gas resources are still plenty and are able to provide cleaner energy. The using of gas resources can affect oil subsidy control, which increases each year. Regarding regulation Art 7 point (4) no (2b) ACT No. 22/2011 about APBN 2012, states that : "The policy regarding oil subsidy control can be done by increasing the use of alternative energy such as nuclear fuel and gas fuel". Based on Perpres No. 5/2010 regarding RPJMN 2010-2014 which states about the gradual decreasing of subsidy and targeting the subsidy to the poor, and also using the subsidy to develop EBT.
The using of gas for transportation will be naturally forced by the availability of gas and infrastructure. The preparation of gas supply is based on Permen ESDM no. 19/2010 about the using of natural gas for transportation's fuel, which requires gas used for transportation to be allocated gradually from gas KKKS (40% of DMO) and BU (minimal percentage 10% of natural gas traded).

2. Market

As mentioned before in previous chapters about the increase of subsidized oil price issue into Rp. 6000,-. Whereas, at the present day, the gas price (CNG) is Rp. 3.100,- and planned to be increased into Rp. 4.100,-. The gas price seems to be more interesting than oil price, both premium and pertamax which are priced around Rp. 9.000,- . but on the other hand, most of vehicles in Indonesia use premium, so that converting the use into gas fuel will need a quite big initial investment to buy and install converter kits which priced around 12,5 millions Rupiah. But by thorough observation, converting oil fuel into gas fuel will be very beneficial nowadays

3. Supply

In April 2012, an agreement regarding natural gas was reached in the transportation sector. Diversification oil fuel (BBM) into gas fuel in transportation sector proved the seriousness of the government in giving an option for transportational fuel and to decrease the use of expensive and non-environmentally friendly BBM. This is stated in ACT No 30 year 2007 regarding the mandatory about the need of diversification to decrease the use of oil fuel, and this is supported by Perpres No. 5 year 2006 which stated that the target of energy from natural oil use should decrease from 51% to 20% in 2025. Based on the agreement, 35,5 MMSCFD of natural gas allocation will be allocated to:

- Jabodetabek, which is supplied by PT Pertamina EP, Medco E&P Indonesia, PT PHE ONWJ, PT Perusahaan Gas Negara (Persero) Tbk and JOBP Talisman Jambi-Merang, with total volume of gas 23,1 MMSCFD.
- Surabaya, Gresik and Sidoarjo, which are supplied by PHE West Madura Offshore and Santos with total volume of gas 10,2 MMSCFD; and
- Palembang, supplied by SP2J and Pertamina EP with total volume of gas 2,2 MMSCFD (esdm.go.id, 2012).

4. Technology

- **Converter Kit**

Gas fuel Converter Kit consists of several components; the tank, regulator, electronic valve, reducer, filter, injector and the ECU (Electronic Control Unit), all with their own distinctive functions. This system is generally installable on cars without the need to modify much of the vehicle, it only needs a drill onto the luggage floor to install the tank bracket. Luggage volume therefore will be reduced for the gas tank. However, the tank is also installable at the reserve tyre space, while the luggage will remain reduced by the displaced reserve tyre itself

- Gas-refueling Station (SPBG)

The number of public transports and the local government's operational vehicles reach 100.000 units. To serve about 100.000 vehicles whose fuel consumption varied from 10 LSP (Bajaj), 30 LSP (Taxis, Microbuses etc), 90 LSP (Mid-sized Buses) and 200 LSP (full-sized Buses), Jakarta will need gas fuel supply (CNG and LGV) approximately 3.788 KLSP/day. Should two-third of the 100.000 vehicles using CNG, the rest using LGV, whereas the supply, ideally, to be served trough 261 fuel stations (dispensers). If every station had 4 dispensers, Jakarta and its surrounding needs at least 65 gas fuel stations.
As for the CNG fuel station, there are two types of gas fuel stations: Mother – Daughter system, supply from local pipe or pipeline system.

5. Financial&Investment

Prior to take any investment decision, and in addition to technical review, an important prerequisite is to study the financial and economical aspects. There are several methods such as NPV, IRR and pay back period which are common parts of this study.

- Feasibility Study

Feasibility study is a judgment in taking a decision; whether to accept or otherwise refusing a business idea or a project plan. The term feasibility here is by understanding the profitability that a business idea or a project plan has offered, either financially or socially. Business feasibility study is a depiction of the planned business activities, by taking into account the condition, potential, and opportunity available. Business feasibility study typically uses investment feasibility, where principally more or less equal with the investment itself. Investment feasibility may be categorized into financial feasibility and economical feasibility.

Determining the investment feasibility criteria.

The main indicator in determining economical feasibility in an investment is the NPV (Net Present Value), IRR and Pay Back Period.

a. NPV (Net Present Value)

Investment is deemed to be feasible if evaluation results indicate positive NPV. Present Value (PV) is the current value of return gained within a subsequent year. While the Net Present Value (NPV) is a modulus between the return and cost within a year.

b. Internal Rate of Return (IRR)

IRR is discount rate / interest rate at the time NPV = 0. An investment is acceptable if only IRR is greater

than the set interest rate. The higher IRR means the more feasible investment is.

c. Payback Period (PBP)

PBP is a period must be taken for the investment fully returned. The shorter PBP means the more feasible investment. PBP is a number when the accumulative present value (NPV) turns into positive.

- **Sensitivity Analysis**

Uncertainty of the economical variables will affect the analysis accuracy which in return, alters a project's feasibility. Uncertainty quantification of an investment can be sought by its profitability, which in this case the NPV; whether the variables within DCF analysis calculation changed. Judgment parameters in a sensitivity analysis are:

- product price
- production capacity
- capital expenditure
- operational expenditure
- exchange rate treatment & refinement cost

III. BUSINESS SOLUTION

Total, the support towards this governmental program will be concentrated on one type of gas, it is on CNG, not on LGV which has smaller number of supply.

A. Alternative of Business Solution

These are some scenarios that is made:

1. **Hybrid Station (Pipeline),** In this scenario, it will be assumed that an SPBU that has operated for some time and is passed by a pipe line that supplies gas fuel for transportation will be modified
2. **Full CNG Station (Pipeline),** Scenario 2 with investment model like below is an SPBG with two dispensers that supplies gas through a pipe drawing system from the main pipe line to the ones on hand.
3. **Daughter Station,** in this scenario storage Cascade containing consumable CNG is being transported. It means those storage tubes are replaced according to the consumption need at SPBG. Construction of SPBG with this system can be done without observing the gas pipe on hand at the planned location.
4. **Hub System,** The concept is by installing a packet of Mother – Daughter System by which subsequently will serve the Daughter station as planned.

Budgeting

Type of Station	Location	Construction Cost
Hybrid System	Daanmogot	4.455.000.000,00
	Bekasi	4.455.000.000,00
	Wr. Buncit (Mampang)	4.455.000.000,00
	Mt. Haryono (Tebet)	4.455.000.000,00
	Total	**17.820.000.000,00**
Pipeline	Kalideres	9.450.000.000,00
	Pasar Minggu	9.450.000.000,00
	Kampung Melayu	9.450.000.000,00
	Total	**28.350.000.000,00**
Daughter	Cipulir	8.250.000.000,00
	Ciledug	8.250.000.000,00
	Bintaro	8.250.000.000,00
	Total	**24.750.000.000,00**
Mother & Daughter	Kerawang (Mother)	25.820.000.000,00
	Blok M (Daughter)	8.250.000.000,00
	Slipi (Daughter)	8.250.000.000,00
	Tanah Abang (Daughter)	8.250.000.000,00
	Lebak Bulus (Daughter)	8.250.000.000,00
	Pondok Cabe (Daughter)	8.250.000.000,00
	Veteran (Daughter)	8.250.000.000,00
	Pondok Indah (Daughter)	8.250.000.000,00
	Kebon jeruk (Daughter)	8.250.000.000,00
	Karawaci (Daughter)	8.250.000.000,00
	Cibubur (Daughter)	8.250.000.000,00
	Total	**108.320.000.000,00**
	GRAND TOTAL	**179.240.000.000,00**

B. Analysis of Business Solution

There are some scenarios that is made:

1. Hybrid Station
   Expected Return (Best Assumption).
   By an investment of no more than Rp. 4.5 billion, it will produce NPV of about Rp. 5.8 billion as well as a payback period of four years, which is very interesting for businessmen and investors. As the result of a relatively low investment cost as well as no high operational cost, it may become a diversification business for the management of SPBU.
2. Full Station(Pipeline System)
   This proposal is mostly used in Pakistan and other countries who uses natural gas for the fuel of their vehicles. This type is chosen by many because of its efficiency, since it does not need an operational cost, as well as compressed gas cost.
   For the construction of SPBG with two dispensers, the investment is Rp. 9.4 billion and NPV of Rp. 17 billion, as well as a payback period in the second year is an invitation for retail gas company holders for public transportation. This proposal is the most interesting one compared to the others based on the feasibility of financial parameter.
3. Daughter Station
   Because this Service Station is intended with only having two dispensers, the required investment is about Rp. 8.25 billion with NPV of Rp. 3.3 billion, as well as a payback period of eight years. If compared to the feasibility parameter at the pipeline system, this scenario is less interesting.
   As shown above, the cost and price structure of gas compression from the supplier (Mother

Station) can be seen, which is Rp. 1.810 or twice as much as the selling price of the gas itself (Rp. 987.28). This is the reason why there is no SPBG with this model in Indonesia. The Daughter System is highly used by industry, certainly with prices and regulations that are much different than that designated for SPBG, making it hard to be adopted immediately.

4. Mother daughter System

This scenario is very interesting, but has a relatively high risk because the total value of investment that is used is fairly large, which is Rp. 108 billion, that is divided into the Mother Station Rp. 25.8 billion, and each Daughter Station Rp. 8.25 billion, with NPV of Rp. 124 billion and payback period of 5 years.

It can be seen that the following proposal is somewhat solutive, where the Mother Station obtaines a direct purchasing price from the gas pipe supplier. In observation, there is a possibility that in a larger scale of construction, it will increase the efficiency that will affect on the decreasing operational cost and a wider margin.

CAPITAL EXPENDITURE (CAPEX)

No.	Material	amount	Volume	Price
1	Construction	1	pac	3,730,000,000.00
	Building, canopy & paving area	*1500*	*m2*	*2,700,000,000.00*
	Furniture by Heksagon	*1*	*pac*	*190,000,000.00*
	Lighting by Philips	*1*	*pac*	*130,000,000.00*
	Signage by ACE	*1*	*pac*	*450,000,000.00*
	POS System by Wincor Nixdorf	*1*	*pac*	*260,000,000.00*
2	Compressor (2 Nm/hr) - 200bar	1	ea	1,500,000,000.00
3	Compressor (1 Nm/hr) - pusher	1	ea	800,000,000.00
4	Genset	1	ea	270,000,000.00
5	Dispenser	1	ea	315,000,000.00
6	Storage (cascade - 90 LWC)	1	ea	4,000,000.00
7	Pipe - inlet from PGN or etc.	1	m	5,000,000.00
8	Pipe - outlet to dispenser	1	m	1,000,000.00
9	Permit (ind. IMB, oprt & Migas)	1	pac	1,000,000,000.00
10	Miscelaneous	1	pac	100,000,000.00

Feasibility summary (IDR ,000)

Scenario	Total Investment	BEP (year)	NPV	IRR	ROE
1. Hybrid Station	4.455.000,00	4 (Four year)	5.836.590,47	28,07%	12,20%
2. Pipeline full station	9.450.000,00	4 (Two year - Early)	17.031.225,25	33,40%	15,49%
3. Daughter Station	8.250.000,00	8 (Eight year)	(4.204,30)	10,99%	3,47%
4. Mother - Daughter St	108.320.000,00	5 (Five year - early)	124.701.618,32	25,94%	11,15%
note:	Hctp	: $ 3/Mmbtu			
	Toll fee	: $ 2.16/Mmbtu			
	Currency $ 1	: IDR 9,000			

Sensitifitas analisis

Scenario	Total Investment	Min Price	Max Price	NPV	IRR
1. Hybrid Station	4.455.000,00	987,28	1.825,00	(8.456,34)	10,97%
2. Pipeline full station	9.450.000,00	987,28	1.863,00	(4.770,78)	10,99%
3. Daughter Station	8.250.000,00	3.003,11	3.135,11	(7.835,07)	10,99%
4. Mother - Daughter St	108.320.000,00	987,28	1.481,60	(2.771,73)	11,00%

Sensitifitas analisis

Scenario	Total Investment	Min USD rate	Max USD rate	NPV	IRR
1. Hybrid Station	4.455.000,00	9.000,00	16.630,00	(3.328,24)	10,99%
2. Pipeline full station	9.450.000,00	9.000,00	16.985,00	(8.808,32)	10,98%
3. Daughter Station	8.250.000,00	9.000,00	10.202,00	(4.204,30)	10,99%
4. Mother - Daughter St	108.320.000,00	9.000,00	13.506,50	(9.258,42)	11,00%

IV. CONCLUSION AND IMPLEMENTATION PLAN

Hybrid Station

The concept which adds dispenser in existing SPBU actually accelerates this pilot project process. Because there are not time is wasted in negotiating the land with land lord or other conflicts in finding land.

During preparation time, the process of contractors-searching for the project takes a lot of time, in this case, the engineering team can start to look for references and technical recommendation from several experienced and reputable contractors.

Scenario 1

Summary Analysis:	
NPV	5,836,590.47
IRR	28.07%

Hctp (gate price)	987.28
Toll fee	710.84
Tax CNG (5%)	205.00
Operational & Maintenance	456.85
Margin	1,740.04

Pipeline Full Station

Method to find SPBG locations is very limited because finding locations passed by pipeline is necessary, whereas not all the locations passed by the pipeline meet the criteria from Total (visibility location, traffic, return area to settlement, etc). Moreover, availability of empty land on that area is also a challenge, so limitation to find locations and analysis done by development team becomes a big challenge. The map of gas pipeline locations has been described previously.

Scenario 2

Summary Analysis:	
NPV	17,031,225.25
IRR	33.40%

Hctp (gate price)	987.28
Toll fee	710.84
Tax CNG (5%)	205.00
Operational & Maintenance	518.61
Margin	1,678.28

Daughter Station

The Difference on construction of SPBU is that there is no drilling process needed to install buried tanks, so occupational risk and a long period of time to do the drilling are not needed. Because this daughter station storage tubes are only placed in the place determined. Then the tubes will automatically connect to SPBG operation system, where there is compressor (pusher type) to push into the dispenser. It should be noted that engineering team should design the storage (tubes) and compressor with high safety standard.

Scenario 3

Summary Analysis:	
NPV	3,322,157.04
IRR	16.66%

Hctp (gate price)	987.28
Compressed & Transport fee	1,810.84
Tax CNG (5%)	205.00
Operational & Maintenance	390.77
Margin	706.11

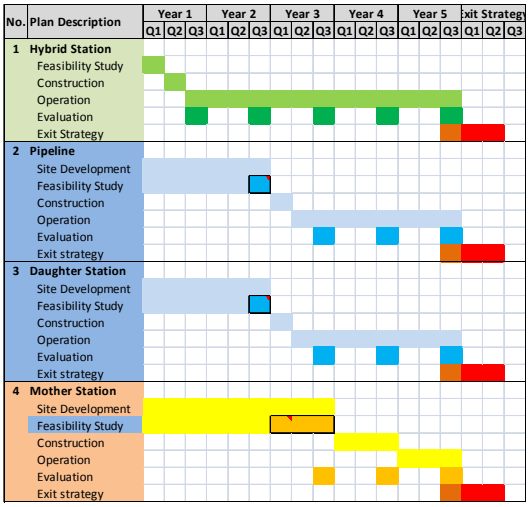
Mother-Daughter System

This mother-daughter station concept is actually combination from pipeline system and daughter system, so location of mother station should be placed in big size and vast land around 4.000 meters. This mother station does not have to be in the city, it can be placed outside the city which has large area of land. But with such distance, delivery expense should also be covered. In addition, selection of daughter system is the same with the previous one.

Scenario 4

Summary Analysis:	
NPV	124,701,618.32
IRR	25.94%

Hctp (gate price)	987.28
Toll fee	710.84
Tax CNG (5%)	205.00
Operational & Maintenance	485.08
Margin	464.92



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